

**DISSERTATION SUMMARY****En route to the first lamellocyte-specific driver**

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The immune system of *Drosophila melanogaster* (fruit fly) is an excellent model for the vertebrate innate immunity because of their homologue signalling pathways. The cellular immune response (phagocytosis, encapsulation and melanisation) is mediated via hemocytes. We are interested in the differentiation of hemocytes, namely in the formation of lamellocytes. To identify activation pathways acting in lamellocyte formation previously we have carried out a UAS/Gal4 screen with UAS-transgenes which are members of known signalling pathways (Zettervall et al. 2004). The UAS-constructs were driven by the *hemese*-Gal4 driver, that uses the promoter/enhancer region of *hemese*, a larval panhemocyte-specific gene (Kurucz et al. 2003). This screen demonstrated that activation of Jun kinase, JAK/STAT, Toll and Wnt signalling pathways in hemocytes lead to lamellocyte formation equally. To dissect this complex picture, we decided to construct a lamellocyte specific Gal4-driver which would enable us to examine the activation pathways regulating lamellocyte formation. To generate this construct, we used the genetic region of *atilla*, a lamellocyte-specific gene, which was identified in our workgroup (Laurinyecz et al. in manuscript). We cloned the

upstream 2 and 4 kilobase 5'UTR containing regions of the *atilla* gene. The transgenic Gal4 constructs were inserted into *Drosophila* embryos, and tested in larvae. One transgenic strain arisen from the 2 kilobase construct showed Gal4 expression in the ejaculatory duct in adult males. Normally this tissue does not express Atilla. Although it was not the required lamellocyte-specific expression, it demonstrated that our transgene can act as an enhancer trap, and it carries the promoter sequence of the *atilla* gene. The 2 kilobase Gal4 construct was designed with additional restriction cleavage sites to use them in the future.

**References**

- Kurucz E, Zettervall C-J, Sinka R, Vilmos P, Pivarsci A, Ekengren S, Hegedüs Z, Ando I, Hultmark D (2003) Hemese, a hemocyte-specific transmembrane protein, affects the cellular immune response in *Drosophila*. Proc Natl Acad Sci USA 100(5):2622-2627.
- Zettervall C-J, Anderl I, Williams MJ, Palmer R, Kurucz E, Ando I, Hultmark D (2004) A directed screen for genes involved in *Drosophila* blood cell activation. Proc Natl Acad Sci USA 101(39):14192-14197.